Doosan Infracore
Machine Tools

DBC Series

Full Line Up of Horizontal Boring Mill

DBC Series design to enhance customer's productivity

Speedy Response to the Market Request

1. Complete Full line up from Part Machining to Mold & Die of highly Productive Purpose.
2. Various Attachment line up preparative countermeasure Increasing high Value-added Machining

Customer Oriented effort to Improvement

1. Operation Improvement by New Control Panel and Change of Various Manipulating Switches.
2. Enhanced Reliability through simplifying Wiring & Easy Maintenance.

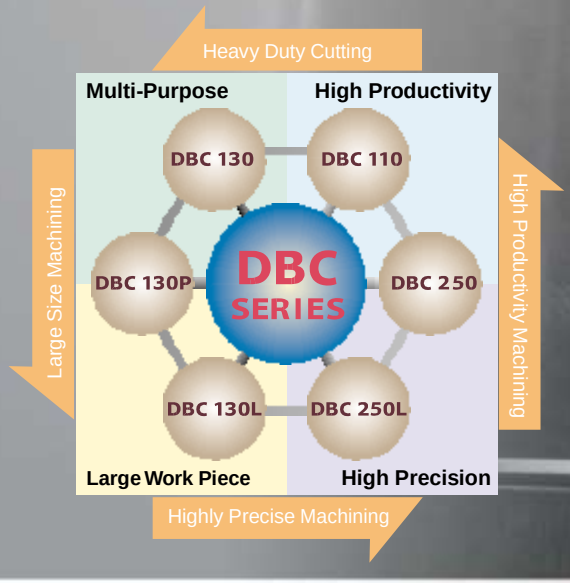
DBC SERIES

New Line-up & Naming of DBC Series

DBC 130L

- **Suffix Letter**
  - **(None)** : Standard
  - **L** : Extended stroke
  - **P** : Plain table
  - **B** : Combination table
- **Spindle diameter (mm)**
  - **110, 130, 150**
  - **Quill diameter (mm)**
  - **200, 250**
- **Machine Structure**
  - **C** : Column moving
  - **T** : Table moving
  - **F** : Floor type
- **Doosan NC Boring**

Market Segmentation



DOOSAN has poured all of its efforts and energies to achieve high performance and rigidity.In the meantime,wide selections of optional accessories are available to fulfill your special applications. We guarantee that you will be totally satisfied with DBC Series.

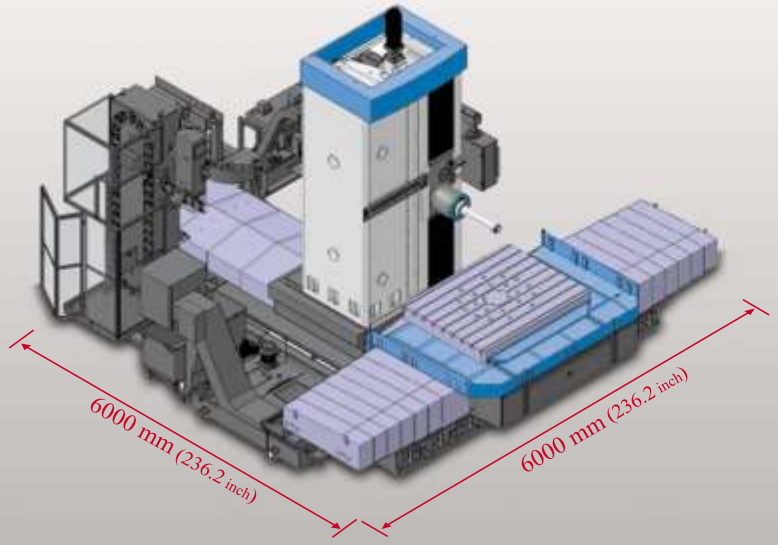
Variable Line-up DBC series

Full Line up of DBC series for Variable Machining.

Compact Type Model

DBC 110

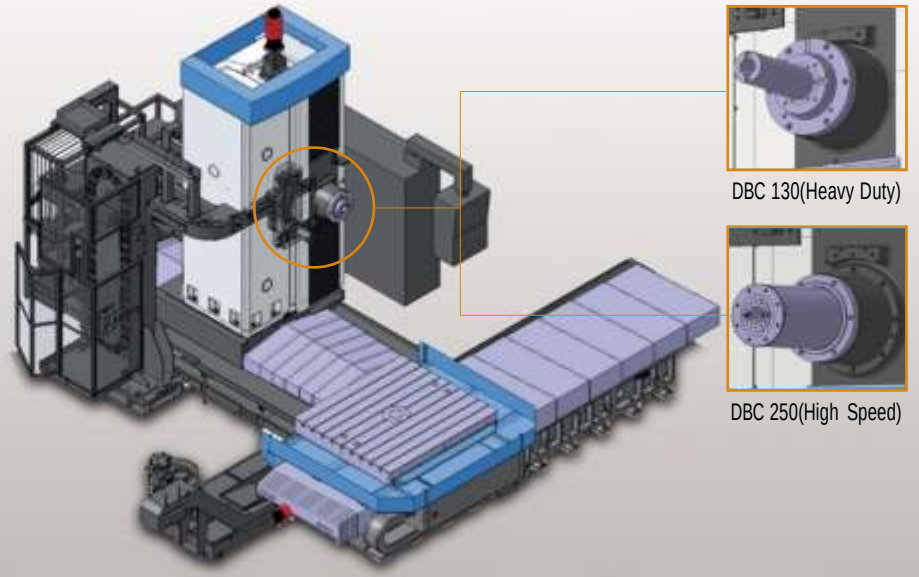
* Designed by compact size and minimized space for high speed heavy cutting
* Approaching to the table center through W-axis stroke



General & Conventional Type Model Best Seller

DBC 130 / DBC 250

* Production over 1000 machines
* More stable and improved model for conventional job and heavy working



Large Sized Work-piece Model

DBC130L / DBC 250L

* Wide work area through axes extension
* Column moving type for big size machining
* Multitasking for various work

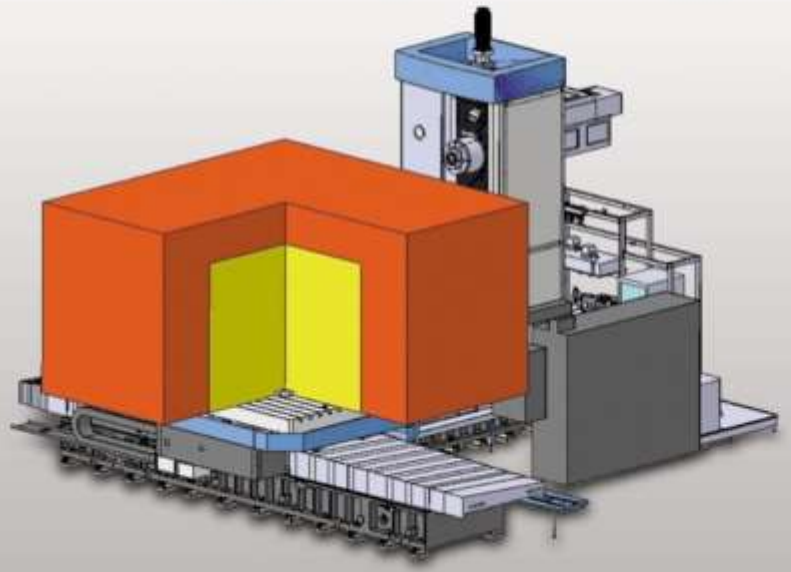
Stroke (mm) X/Y/Z

4000 / 2300 / 2000 mm
(157.5 / 90.6 / 78.7 inch)

Maximum work diameter

DBC 130/250
ø 3400 mm
(ø 133.9 inch)

DBC 130L/250L
ø 4500 mm
(ø177.2 inch)



Heavy Load Work-piece Model

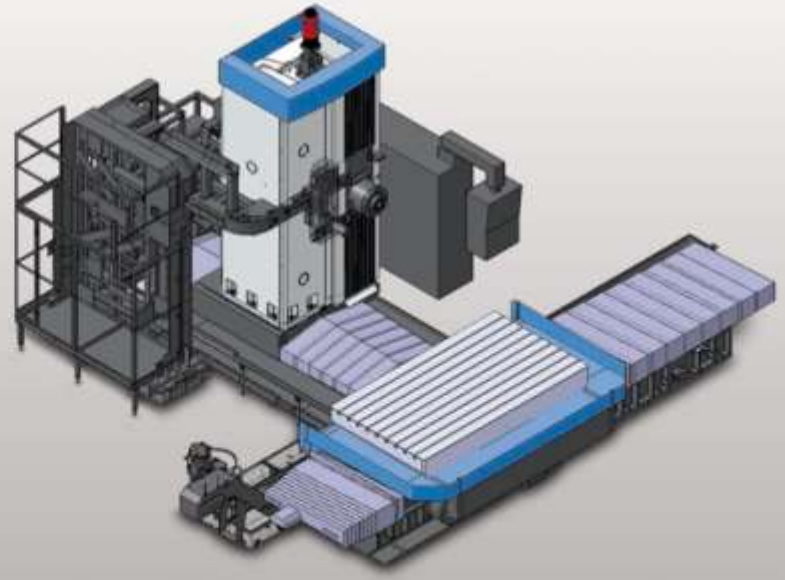
DBC 130P

* Plain type table for heavy load performance
* Without B-axis

Plain type table

Table length
3000 mm (118.1 inch)

Load capacity
20000 kg (44091.8 lb)



High Performance DBC series

High speed spindle of high quality and rigidity
helps increase the efficiency and performance of the machine.

High Speed and Powerful Spindle

Improved thermal stability through perfect cooling control

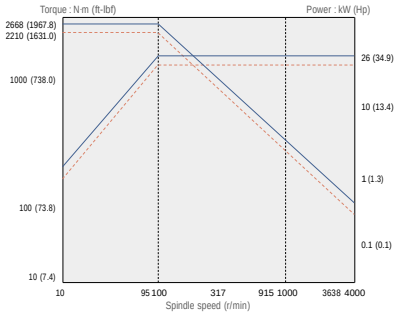
Use of ultra precision paired spindle bearings ensures high speed, heavy-duty and high precision machining. Perfectly wrapped cooling system of geared box spindle (On DBC 110/130) for heavy duty machining and built-in spindle (On DBC 250) for high speed machining.

Max. spindle speed

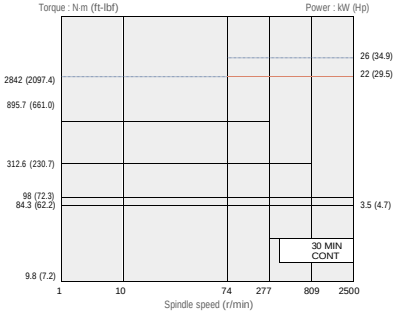
DBC 110	DBC 130/130L/130P	DBC 250/250L
4000 r/min	2500 r/min	6000 r/min

Spindle power-torque diagram

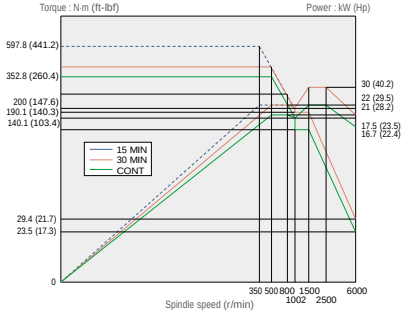
DBC 110 : 26/22 kW (35/30 Hp)



DBC 130/130L/130P : 26/22 kW (35/30 Hp)



DBC 250/250L : 30/22 kW (40/30 Hp)



DBC 110

High speed boring spindle

High-torque and powerful spindle for heavy duty cutting

- W-axis clamping device as standard
- High-power main spindle available

Model	Spindle speed (r/min)		Spindle motor [kW(Hp)]		Torque [N·m(ft-lbs)]
	Standard	Option	Standard	Option (15 min)	
DBC 110	4000	-	26/22 (35/30)	30/22 (40/30)	2668 (1968)

DBC 130 / 130L / 130P

Heavy duty cutting boring spindle

High-torque and powerful spindle for heavy duty cutting

- W-axis clamping device as standard
- High-power main spindle available

Model	Spindle speed (r/min)		Spindle motor [kW(Hp)]		Torque [N·m(ft-lbs)]
	Standard	Option	Standard	Option (15 min)	
DBC 130/130L	2500	3000	26/22 (35/30)	30/22 : AMP (40/30)	3354 (2474)

DBC 250 / 250L

High speed built-in quill spindle

High speed Built-in spindle for high precision machining

- Rigid structure for quill feeding
- Grease-typed lubrication for the spindle bearings
- Stable thermal growth of the spindle bearings despite a long run

Model	Spindle speed (r/min)		Spindle motor [kW(Hp)]		Torque [N·m(ft-lbs)]
	Standard	Option	Standard	Option	
DBC 250	6000	-	30/22 (40/30)	-	598 (441)

High Rigidity DBC series

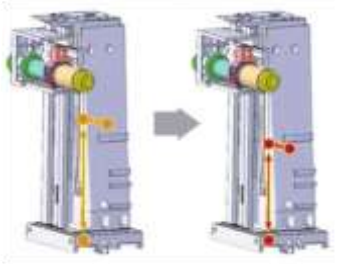
Stable bed and column assembles are designed heavy duty machining and durability.

Enhanced Rigidity

The two piece bed is rigid and heavily ribbed Meehanite. These castings remain stable even under the heaviest cutting conditions. Fine grained Meehanite cast iron is used for its excellent vibration absorbing characteristics. The table is fully supported by the saddle in all positions and there is no table overhang. All axes have highly rigid and precise box guideways.

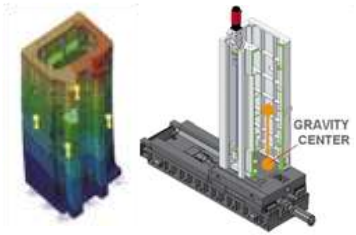
Rigidity of the column

Lowered the center of gravity for minimized the vibration (Z-axis)



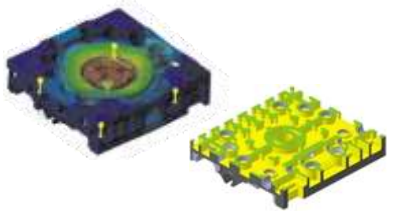
Minimized initial vibration
Reduced residual vibration

High Rigid Structure Design of Considering the Machining Capacity

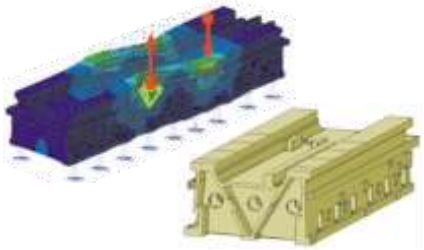


Lower center of gravity of the column to minimize the vibration of the column moving.

- The Y-axis clamp device is attached to the standard.



Appropriate Rib design of the Table & Table base to minimize deformation under Max. Load

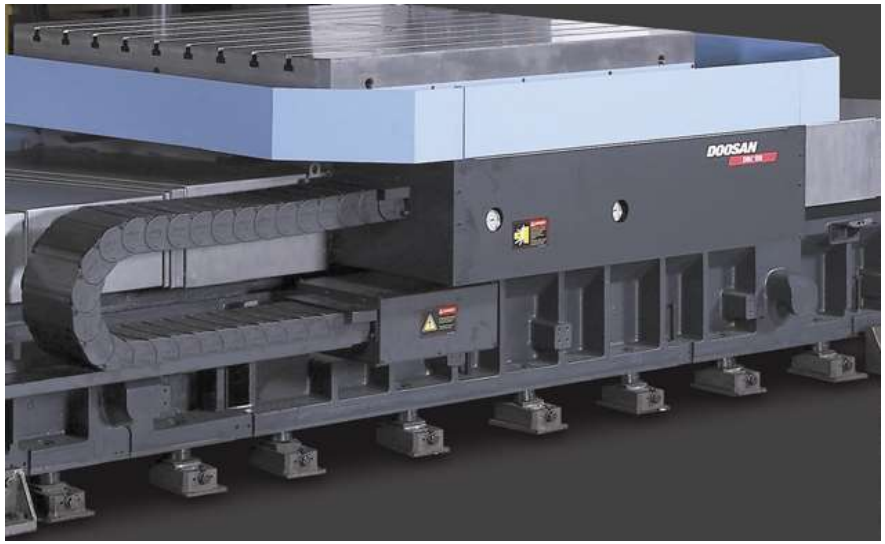


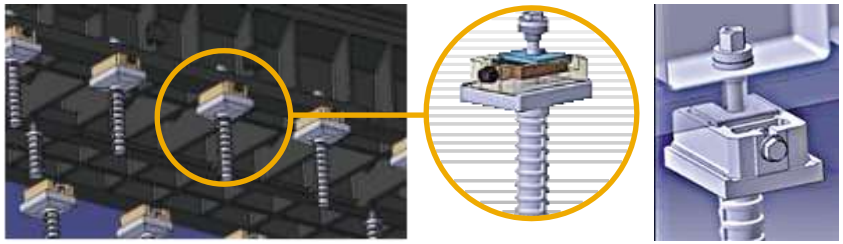
Bed internal design of the M-Type rib minimize deformation and vibration

Machine Structure

Strengthened foundation plan

Inserted ribs reinforce the structural rigidity and dynamic damping characteristics to external load and flowing stress. In any operating conditions, the machine can be maintained under optimal condition.





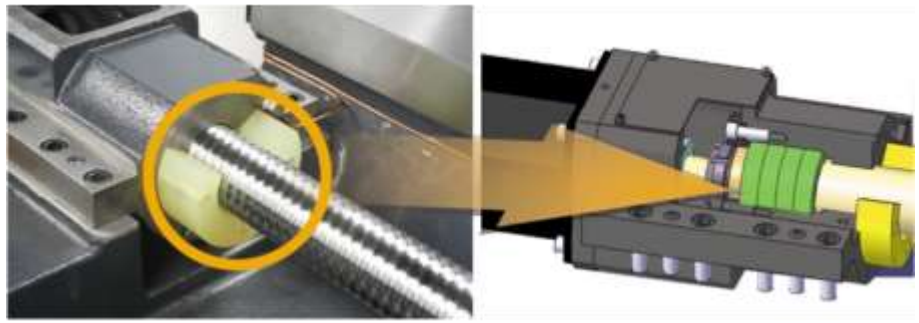
All foundation level blocks ensure life time guarantee on precision and easy & fast installation work.

Enhanced rigidity of the axes

Narrow guide system makes Minimized twisting moment effect (X-axis & Z-axis) and Decreased table shaking

Big diameter ball screw & 4 rows bearing

The 4 rows bearing has increased machine rigidity and decreased heat generation of ball screw.



Superb Accuracy DBC series

High Precision NC Index Table (0.001˚ : B-Axis)

Rotary Table

Double pinion / worm

High precision table 90˚±5 s

- B-axis rotary encoder equipped as standard
- Automatic backlash adjusting mechanism

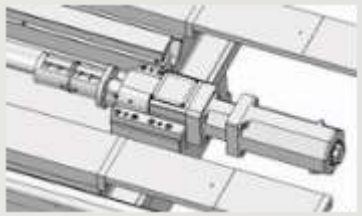
High precision locate pin

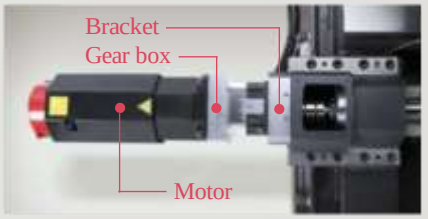
Double pinion [DBC 130(L) & DBC 250(L)]

Reduction Gear Box for High Torque (X/Z) opt.

To increase thrust force by using servo reducer

DBC Series





Cutting condition

- Big Size Deep Hole Drill
  Tool Dia. : ø127 mm (5 inch)
- Spindle Speed : 100 r/min
- Feedrate : 12.7 mm/min
  (0.05 ipm)

*** Z-Axis Load Meter : 56%**

* : Only reference

Easy Chip Disposal DBC series

Chip treatment from the viewpoint of productivity improvement and environmental countermeasure is important. DBC series offer a variety of chip control equipment to provide enhanced accuracy and better chip removal capabilities.

Easy Chip Removal Structure

The completely enclosed DBC series guarantee the confinement of chips and coolant to the inside of the machining area. Chips fall into the removable forward mounted chip pan for easy disposal.

Chip pan

Chip conveyor opt.

Coil conveyor

The coil type front side conveyor remove chip and coolant easily.

Coolant gun opt.

ATC & Magazine

DBC series

User friendly design for operator.

Servo Driven ATC opt.

Tool Magazine & carriage by servo control will be accomplished higher reliability, speed smooth operation and reducing noise.

Servo tool magazine & servo carriage

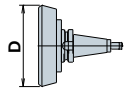
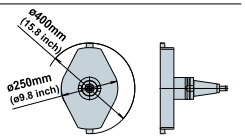
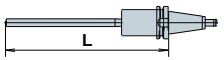
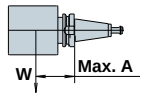
Automatic tool changer

Servo tool magazine

Servo carriage

Acceptable tool dimensions

Tool magazine

	Spec.	Shape
Max. Tool Diameter	Facing Tool D=ø250mm (9.8 inch)	
	Boring Tool D=ø400mm (15.8 inch) [ø600 mm (23.6 inch)] opt.	
Max. Tool Length	L = 600 mm (23.6 inch)	
Max. Tool Weight	W = 25 kg (55.1 lb) W = 30 kg (66.1 lb) opt.	

Allowable moment : 34 N·m

Optional Equipment DBC series

Various Optional Equipments

Depending upon the customer's request, a special development is possible.

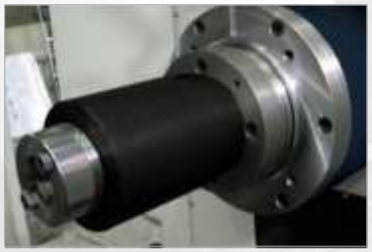
Angle Head (Manual) (L=365)

Long Type Angle Head (Manual) (L=660)

Universal head (Manual)

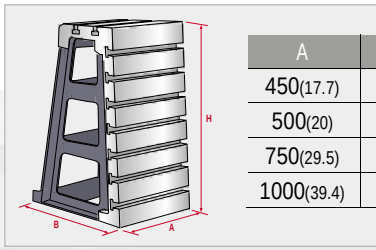
Face plate (Manual)

Indexable Angle Head (90˚ index)



Spindle support

Facing head(Cogsdill)



A	H	B
450(17.7)	600(23.6)	400(15.8)
500(20)	1000(39.4)	550(21.7)
750(29.5)	1250(49.2)	750(29.5)
1000(39.4)	2000(78.7)	1000(39.4)

Unit : mm (inch)

Angle plate (4 Types)

Advanced CNC system (FANUC-31i) DBC series

Applied cutting edge technology for machine control

Standard of nano control

High speed and quality realization by nano control and Cutting edge servo technology

Easy Operation NC

Compatible control key setting

Control keys are developed for easy operation by soft keys which are separated vertical and horizontal display choice and control choice.

Mistake control protection function

- Data in/out put check function
- Confirm of Data delete
- Check message when data renewal
- Check when program operation

File management & editing function similar to that of a PC

Naming of programs with up to 32 characters
Paging subprograms with file names
Program management by folder.

Memory card slot

- DNC operated function by CF Memory card
- Custom macro function, Sub program call
- Data procedure and editing

Compact flash card

Easy to Use Operation

Peripheral equipment which contains frequently used operational devices is standardized.

- Mono lever jog switches when try to set-up large size machine , very easily can do it

- Mono lever jog switches

- Portable MPG

- MPG with LCD display opt.

- ATC OP panel opt.

Monitoring & Managing Function

Doosan tool load monitoring opt.

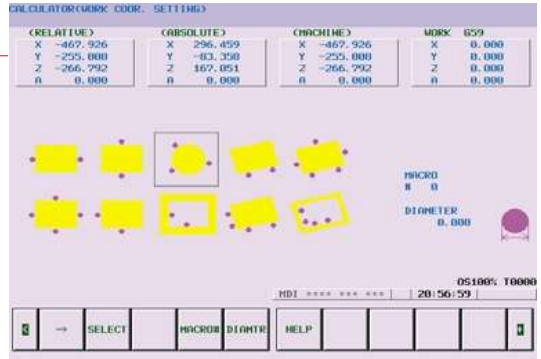
- Inform to operator tool wear or break, when some cases occur. It is designed for protecting tool&work-piece. also it can save tooling list that belong the each works.

Doosan tool management opt.

- Users can see which number of tools is stored in each magazine pockets. the status of each tool are displayed, tool wear, tool break, tool life etc. also has pre-checking function

Easy Set-up Guidance opt.

The work coordinate system can be set easily and simply by getting the tool or test bar in touch with work and making operations on the screen.
Also it can be used for the automatic measuring probe.



Optional Fuction DBC series

Machining Support Function Example

Work load counter control

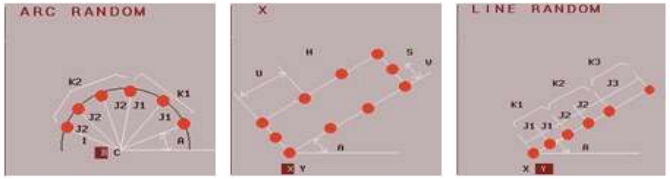
- This function will help upgrading machining efficiency. if customer select proper M-Code according to weight of the work piece, machine can decide itself best moving pattern of the table. And machining can make progress by this decision.

M-Code	Work Load	DBC 110	DBC 130	DBC 130L	DBC 130P	DBC 250	DBC 250L
M380	5 Ton and less	●	●	●	●	●	●
M381	10 Ton and less	●	●	●	●	●	●
M382	15 Ton and less		●	●	●	●	●
M383	20 Ton and less				●		

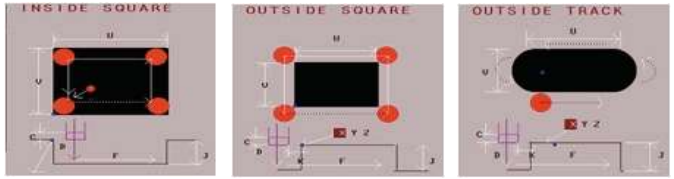
Easy Pattern Cycle opt.

This software provides machining patterns required for part machining.
It will greatly reduce programming time and can be used for machining on the shop floor immediately.

Drilling pattern



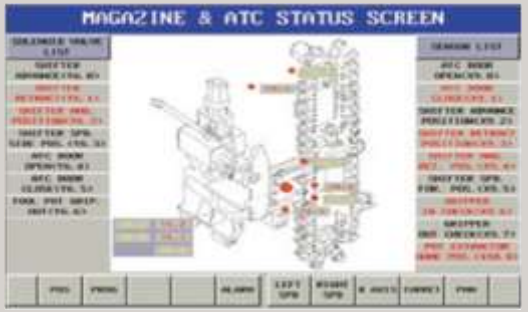
End-mill pattern



Support Function for Maintenance

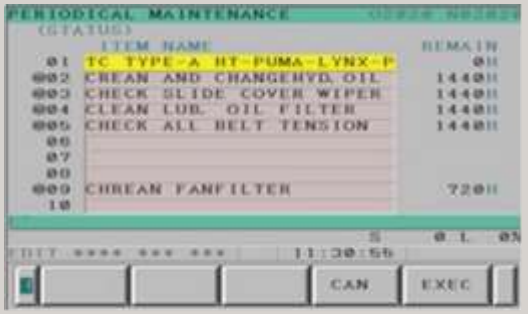
Alarm guidance opt.

- Alarm detail display and history display.
- Status display of major device



Periodically checking function

- Periodic inspection inform is displayed Consumable goods such as grease and oil.

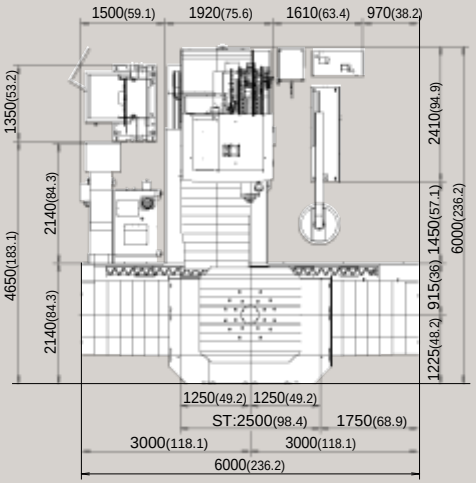


External Dimensions & Table Dimensions

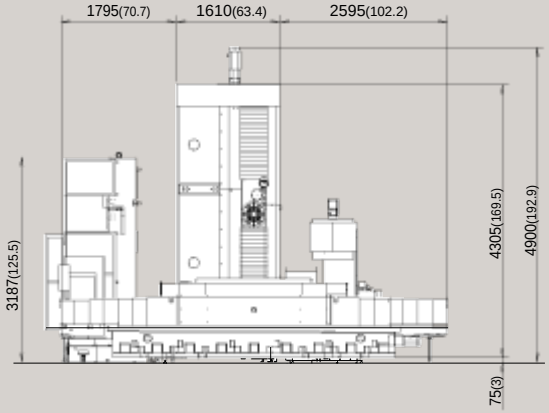
Unit : mm (inch)

DBC 110

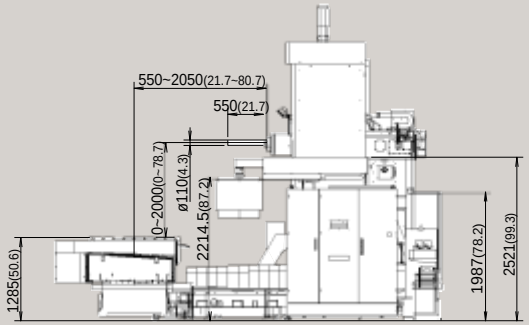
Top View



Side View

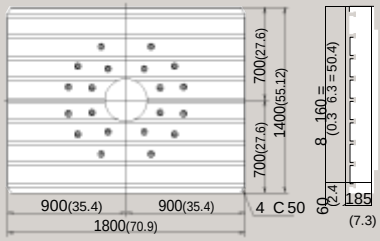


Front View

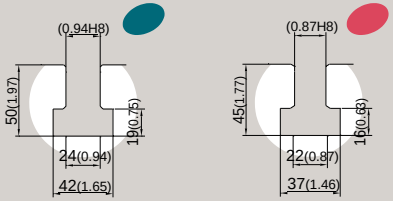


Table

1400 X 1800 (55.1 X 70.9) std.



T-Slot

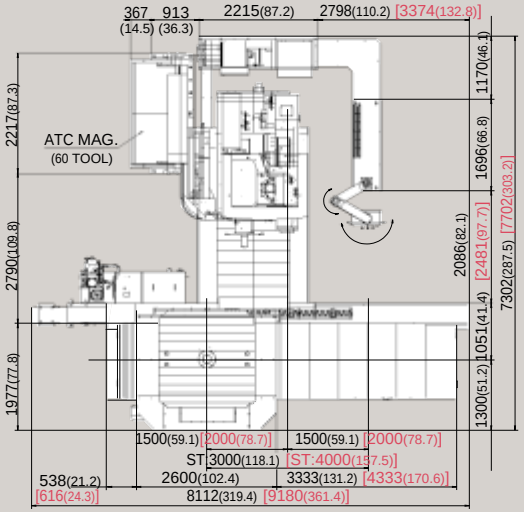


External Dimensions & Table Dimensions

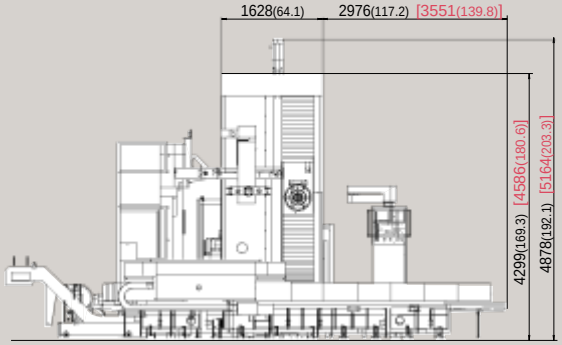
Unit : mm (inch)

DBC 130 / 130L

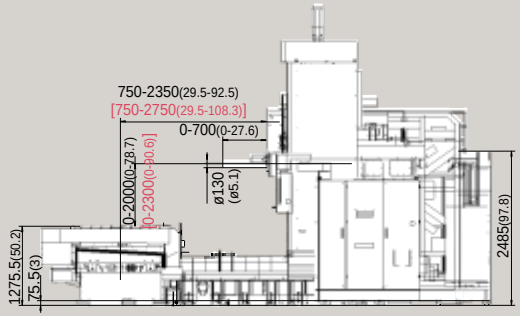
Top View



Front View



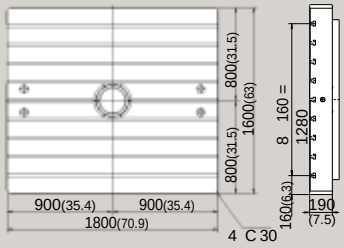
Side View



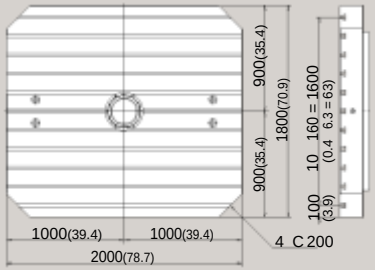
[ ] : DBC 130L only

DBC 130[L]

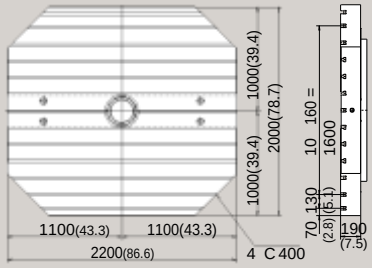
1600 X 1800 (63 X 70.9) std.



1800 X 2000 (70.9 X 78.7) opt.

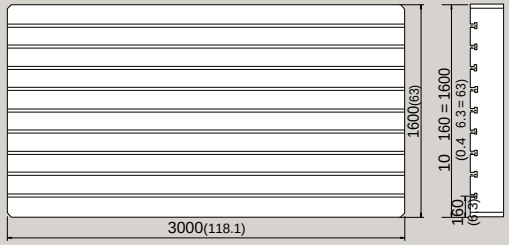


2000 X 2200 (78.7 X 86.6) opt.

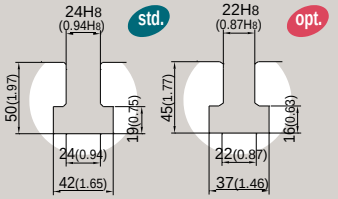


DBC 130P

1600 X 3000 (63 X 118.1) opt.



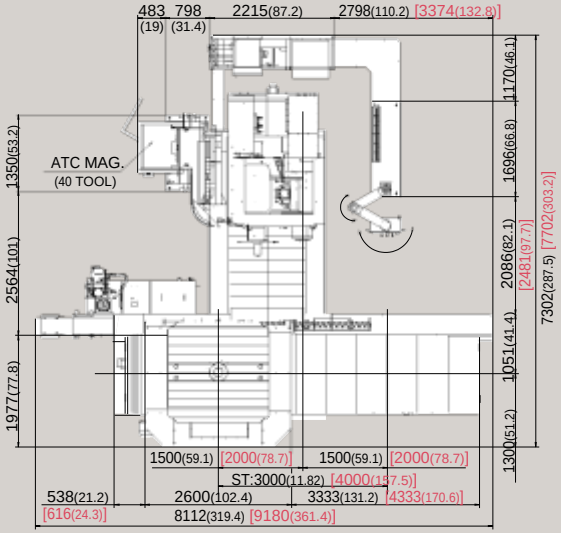
T-Slot



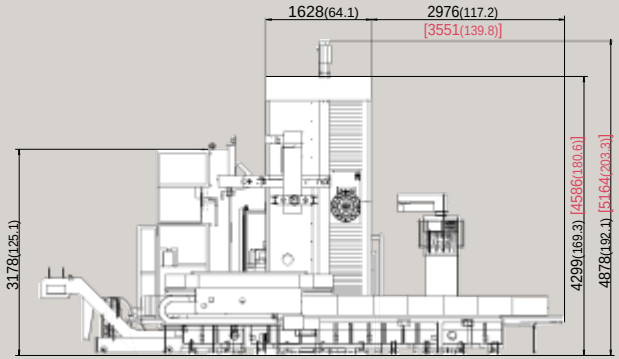
Unit : mm (inch)

DBC 250/250L

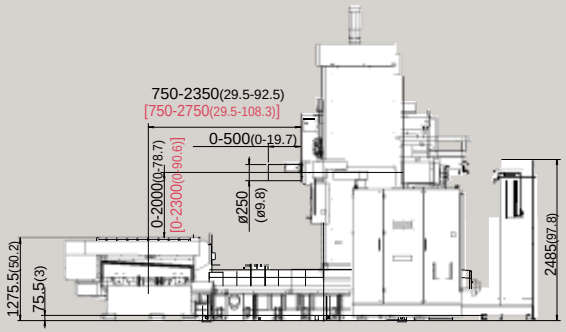
Top View



Front View

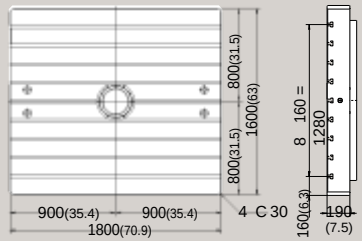


Side View

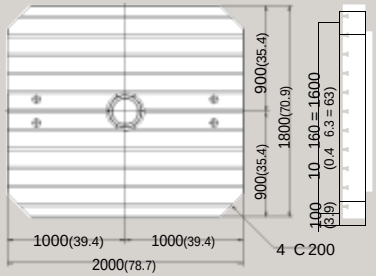


[ ] : DBC 250L only

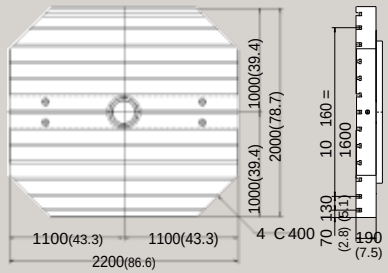
1600 X 1800 (63 X 70.9) std.



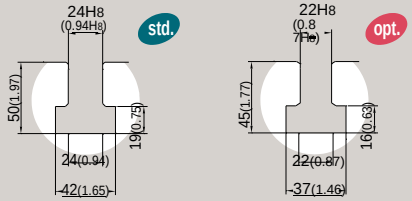
1800 X 2000 (70.9 X 78.7) opt.



2000 X 2200 (78.7 X 86.6) opt.



T-Slot



Machine Specifications

Unit : mm (inch)

Features			DBC 110	DBC 130	DBC 130L	DBC 130P	DBC 250	DBC 250L
Travel	X axis	mm(in.)	2500 (98.4)	3000 (118.1)	4000 (157.5)	3000 (118.1)		4000 (157.5)
	Y axis	mm(in.)	2000 (78.7)		2300 (90.6) {2500 (98.4)}	2000 (78.7)		2300 (90.6) {2500 (98.4)}
	Z axis	mm(in.)	1500 (59.1)	1600 (63)	2000 (78.7)	1600 (63)		2000 (78.7)
	W axis	mm(in.)	550 (21.7)	700 (27.6)			500 (19.7)	
	Distance from spindle center to table top	mm(in.)	0 ~ 2000 (0 ~ 78.7)		0 ~ 2300 (0 ~ 90.6)	0 ~ 2000 (0 ~ 78.7)		0 ~ 2300 (0 ~ 90.6)
	Distance from spindle nose to table center	mm(in.)	550 ~ 2050 (22.7~80.7)	750 ~ 2350 (29.5~92.5)	750 ~ 2750 (29.5~108.3)	750 ~ 2350 (29.5~92.5)		750 ~ 2750 (29.5~108.3)
Table	Table size	mm(in.)	1400 x 1800 (55.1 x 70.9)	1600 x 1800 {1800 x 2000, 2000 x 2200} (63 x 70.9) {(70.9 x 78.7, 78.7 x 86.6)}		1600 x 3000 (63 x 118.1)	1600 x 1800 {1800 x 2000, 2000 x 2200} (63 x 70.9 {70.9 x 78.7, 78.7 x 86.6})	
	Tavle loading capacity	kg(lb)	10000 (22,045.9)	15000 (33,068.9) {13000, 12000 (28,659.7, 26,455.1)}		20000 (44,091.8)	15000 (33,068.9) {13000, 12000 (28,659.7, 26,455.1)}	
	T-SLOT		24H8 x 9 {22H8}					
	Continuous dividing table	deg	0.001˚			-	0.001˚	
	Index Degree	deg	90			-	90	
Spindle	Tool Shank		BT50/DIN69871/CAT50(BIG PLUS)					
	Pull Stud		MAS403-P50T-1/DIN69872#50/CAT50					
	Max. spindle speed	r/min	4000	2500			6000	
	Spindle motor (30min/cont.)	kW(Hp)	26 / 22 (34.9 / 29.5) {30 / 22 : AMP (40.2 / 29.5)}				30 / 22 (40.2 / 29.5)	
	Boring spindle diameter	mm(in.)	110 (4.3)	130 (5.1)			-	
	Quill diameter	mm(in.)	-				250 (9.8)	
Rapid traverse rate	X, Y, Z	m/min(ipm)	12 (472.4)	10 (393.7) Except DBC 130P				
	W	m/min(ipm)	6 (236.2)	10 (393.7)				
Cutting feedrate	X, Y, Z	mm/min(ipm)	8000 (315)	1 ~ 4000 (1 ~ 157.5)				
Automatic tool changer	Tool storage capacity	ea	{40 / 60 / 90 / 120}					
	Tool Shank		BT50 / DIN69871 / CAT50 (BIG PLUS)					
	Max. tool diameter	mm(in.)	ø130 (ø5.1) {ø600 (ø23.6)}					
	Max. tool length	mm(in.)	600 (23.6)					
	Max. tool weight	kg(lb)	25 (55.1) {30 (66.1)}					
	Method of tool selection		Fixed address					
Power source	Electric power supply (rated capacity)	kVA	70					
	Compressed air supply		0.54(78.3)					
Machine size	Machine weight	kg(lb)	36000 (79,365.2)	43000 (94,797.4)	47000 (103,616)		43000 (94,797.4)	47000 (103,616)
	Machine dimension(L X W)	mm(in.)	6000 x 6000 (236.2 x 236.2)	7500 x 8200 (295.3 x 322.8)	7800 x 9400 (307.1 x 370.1)	7500 x 9400 (295.3 x 370.1)	7500 x 8200 (295.3 x 322.8)	7800 x 9400 (307.1 x 370.1)
	Machine height	mm(in.)	4900 (192.9)	5000 (196.9)	5300 (208.7)	5000 (196.9)		5300 (208.7)

- Design and specifications are subject to change without notice.
- Doosan is not responsible for difference between the information in the catalogue and the actual machine.

Note : { } are optional.

Standard Feature & Optional Feature

Standard feature

- Spindle Air Purge
- Spindle Oil Cooler
- Spindle Lubrication Device
- Spindle Internal Cooling System
- Axis Gear Box for Y-axis
- B-axis Rotary Encoder
- Automatic Table Clamping Unit
- Automatic Table Locating Pin (each 90˚)
- Hydraulic Power Unit
- Y-axis Clamp
- W-axis Clamp
- Tool KIT
- Leveling Blocks & Anchoring Bolts
- Z-axis Coolant Pan
- Table Chip Pan
- Column Guideway Chip cover
- Slide Way Covers (X/Y/Z)
- Chip Disposal
  - Coil Conveyor & Chip Tray
- Main OP. Panel
  - 2-Linkage type
  - Retractable Rotating type
- Portable-MPG
- Work Light (Halogen Lamp)
- Operator's Call Lamp (Red/Yellow/Green)
- Foot Switch for Tool Unclamp
- Mono Lever Jog Switches
- Spindle Load Meter
- Spindle Thermal Compensation System (DBC 110, 130)
- External M-CODE (4ea)
- Periodical Checking Function
- Actual Spindle Speed Display on LCD
- Self Diagnosis Function
- DSQ1*
- Customer's Manual

* Note)
DSQ1 : AICC II 200 Block + Machine Condition Selection Function

Optional feature

- Attachment
  - Manual Head (L=365)
  - Manual Long Type (L=660)
  - Indexable Angle Head (90˚ Index)
  - Manual Universal Head (L=500)
  - Manual Face Plate (ø650)
  - Spindle Support (L=310)
  - Attachment Ready (Cogsdill)
  - Attachment Ready (D'Andrea)
- Coolant systems
  - Chip Air Blow
  - MQL
  - Coolant Spray Gun
  - TSC-20bar
  - High Capacity Type Coolant Pump
  - Oil Skimmer
- Safety Fence & Interlock Switches
- Coolant Splash Guard
  - Semi Guard
  - Full Guard
- Linear Scale Feedback System
  - Distance coded Type (with Inc. Pulse Coder)
  - Absolute Type (with Abs.Pulse Coder)
- ATC (ATC OP. Panel)
- APC (APC OP. Panel)
- Air Spray Gun
- Auto Tool Length Measurement
- Tool Breakage Detect Function
- Master Tool for Auto-Tool Length Measurement
- Auto Workpiece Management
- Easy Set Up Guidance®
- Calibration Block for
  - Auto-Workpiece Measurement
- Test Bar (BT 50)
- Chip Disposal
  - Chip conveyor Hinged Belt Type
  - Magnetic Scraper Type
  - Chip Bucket 360L
- Raising Block (250mm)
- Additional 6th Axis
  - Package #1 : Only Wiring
  - Package #2 : Hydraulic & Control Ready
  - Package #3 : Full Opt.
- Angle Plate
  - 450 x 600 x 400mm / 500 x 1000 x 550mm
  - 750 x 1250 x 750mm / 1000 x 2000 x 1000mm
- Edge Locator (Table/ Pallet)
- Big Plus® Spindle
- CNC Systems (Heidenhain)
- Auto Power Off
- Auto Power On
- Noise Filter
- Work Counter
- Total Counter
- Electric Leakage Breaker
- Operator's Call Buzzer
- Electric Box Light
- Electric Box Air con
- 3-MPG (Portable)
- Doosan Tool Load Monitoring
- Doosan Tool Management
- Alarm Guidance
- Work Load Counter Control®
- APC Pallet Retract Function
- DSQ2 *
- DSQ3 *
- Easy pattern Cycle
- Speed Limit Control for Attachment
- Machine Warming Up Function

* Note)
DSQ2 : DSQ1 + Data Server(1GB)
DSQ3 : DSQ2 + AICC II 600 Block

CNC Unit Specifications (Fanuc 31i-A)

AXES CONTROL

- Controlled axes	5 (X,Y,Z,B,W)
- Simultaneously controllable axes	
	Positioning(G00)/Linear interpolation(G01) : 3 axes
	Circular interpolation(G02, G03) : 2 axes
- Backlash compensation	
- Emergency stop / overtravel	
- Follow up	
- Least command increment :	0.001mm / 0.0001(inch)
- Least input increment :	0.001mm / 0.0001(inch)
- Machine lock	all axes / Z axis
- Mirror image	Reverse axis movement
	(setting screen and M - function)
- Stored pitch error compensation	
	Pitch error offset compensation for each axis
- Stored stroke check 1	Overtravel controlled by software

INTERPOLATION & FEED FUNCTION

- 2nd reference point return	G30
- Circular interpolation	G02, G03
- Dwell	G04
- Exact stop check	G09, G61(mode)
- Feed per minute	mm / min
- Feedrate override (10% increments)	0 - 200 %
- Jog override (10% increments)	0 - 200 %
- Linear interpolation	G01
- Manual handle feed(1 unit)	
- Manual handle feedrate	0.1/0.01/0.001mm
- Override cancel	M48 / M49
- Positioning	G00
- Rapid traverse override	F0 (fine feed), 25 / 50 / 100 %
- Reference point return	G27, G28, G29
- Skip function	G31
- Helical interpolation	
- NANO AICC (AI Contour Control)	80 block preview
- Thread cutting, synchronous cutting	
- Program restart	
- Automatic corner deceleration	
- Feedrate clamp by circular radius	
- Linear ACC/DEC before interpolation	
- Linear ACC/DEC after interpolation	
- Control axis detach	
- Rapid traverse bell-shaped acceleration/deceleration	

- Dual position feedback	
- Smooth backlash compensation	
- Polar coordinate interpolation	G12.1 / G13.1

SPINDLE & M-CODE FUNCTION

- M- code function	M 3 digits
- Spindle orientation	
- Spindle serial output	
- Spindle speed command	S5 digits
- Spindle speed override (10% increments)	50 - 150 %
- Spindle output switching	
- Retraction for rigid tapping	
- Rigid tapping	G84, G74

TOOL FUNCTION

- Cutter compensation C	G40, G41, G42
- Number of tool offsets	200 ea
- Tool length compensation	G43, G44, G49
- Tool number command	T3 digits
- Tool life management	
	Geometry / Wear and Length / Radius offset memory
- Tool offset memory C	

PROGRAMMING & EDITING FUNCTION

- Absolute / Incremental programming	G90 / G91
- Auto. Coordinate system setting	
- Background editing	
- Canned cycle	G73, G74, G76, G80 - G89, G99
- Circular interpolation by radius programming	
- Custom macro B	
- Custom size 512kb	
- Addition of custom macro common variables	
- Decimal point input	
- I / O interface	RS - 232C
- Inch / metric conversion	G20 / G21
- Label skip	
- Local / Machine coordinate system	G52 / G53
- Maximum commandable value	
	±99999.999mm (±9999.9999 inch)
- No. of Registered programs	200 ea
- Optional block skip	
- Optional stop	M01

- Part program storage	640 m
- Program number	O4-digits
- Program protect	
- Program stop / end	M00 / M02,M30
- Programmable data input	
	Tool offset and work offset are entered by G10, G11
- Sub program	Up to 4 nesting
- Tape code	ISO / EIA Automatic discrimination
- Work coordinate system	G54 - G59
- Additional work coordinate system(48 Pair)	G54.1 P1 - 48 pairs
- Coordinate system rotation	G68, G69
- Extended part program editing	
- Optional angle chamfering / corner R	
- Macro executor	
- Scaling	G50, G51

OTHERS FUNCTIONS (Operation, Setting & Display, etc)

- Alarm display	
- Alarm history display	
- Clock function	
- Cycle start / Feed hold	
- Display of PMC alarm message	
	Message display when PMC alarm occurred
- Dry run	
- Ethernet function(Embeded)	
- Graphic display	Tool path drawing
- Help function	
- Loadmeter display	
- MDI / DISPLAY unit	
	10.4" color LCD, Keyboard for data input, soft-keys
- Memory card interface	
- Operation functions	Tape / Memory / MDI / Manual
- Operation history display	
- Program restart	
- Run hour and part number display	
- Search function	Sequence NO. / Program NO.
- Self - diagnostic function	
- Servo setting screen	
- Single block	
- External data input	
- Multi language display	

OPTIONAL SPECIFICATIONS

- 3-dimensional coordinate conversion	
- 3-dimensional tool compensation	
- 3rd / 4th reference return	
- Addition of tool pairs for tool life management	512 pairs
- Additional controlled axes	max. 6 axes in total
- Additional work coordinate system	G54.1 P1 - 300 (300 pairs)
- AI HPCC* (High Precision Contour Control) with 64 bit Risc	
	600 block preview
- Automatic corner override	G62
- Chopping function	G81.1
- Cylindrical interpolation	G07.1
- Data server	
- Dynamic graphic display	Machining profile drawing
- Exponential interpolation	
- Interpolation type pitch error compensation	
- EZ Guide i (Doosan infracore Conversational Programming Solution)	
	with 10.4" Color TFT
- Tape format for FS15	
- Increment system 1/10	
- Figure copying	G72.1, G72.2
- Manual handle feed 2/3 unit	
- Handle interruption	
- High speed skip function	
- Involute interpolation	G02.2, G03.2
- Look ahead control	G08
- Machining time stamp function	
- No. of Registered programs	400 / 1000 ea
- Number of tool offsets	400 / 499 / 999 ea
- Optional block skip addition	9 blocks
- Part program storage	1280 / 2560 m
- Playback function	
- Polar coordinate command	G15 / G16
- Polar coordinate interpolation	G12.1 / G13.1
- Programmable mirror image	G50.1 / G51.1
- Remote buffer	
- Single direction positioning	G60
- Stored stroke check 2 / 3	
- Tool load monitoring function(doosan)	
- Doosan tool management package I	
- Tool position offset	G45 - G48
- Position switch	

CNC Unit Specifications (Heidenhain iTNC 530)

CONTROL SYSTEMS

- Main Computer : MC 422 C with Windows 2000
  *Cycle times of main computer
  : Block processing time 0.5 ms
- Controller unit : CC 424 B
  *Cycle times of controller unit
  : Position controller 0.2 ms/0.1 ms
  : Speed controller 0.2 ms/0.1 ms
- Visual display unit BF 150 color flat-panel TFT display
- Keyboard : TE 520 B

Inverter systems

- -Compact inverters
- -Modular inverters

Axes : MC 422 C

- Rotary axes Max. 3
- PLC axes
- Synchronized axes

Spindle

- Operating-mode switchover
- Position-controlled Spindle
- Spindle orientation
- Gear stages
- Milling-head change Programmable via PLC

Input resolution and display step

- Linear axes 0.1µm
- Rotary axes 0.0001°

Interpolation

- Straight line In 5 axes
- Circle In 3 axes
- Helix
- Spline

Axis control

- With following error
- With feedforward
- Axis clamping
- Maximum feed rate

MACHINE INTERFACING

Error compensation

- Linear Axis error
- Nonlinear Axis erro
- Nonlinear Axis error
- Backlash
- Reversal peaks With circular movement
- Reversal error
- Thermal expansion
- Stick-slip friction
- Sliding friction

Integral PLC

- Program format Statement list
- Program input via TNC
- Program input via PC
- PLC memory Min. 948 MB on hard disk
- Process memory (RAM) 512 KB
- PLC cycle time 10.8 ms
- PLC inputs 24 V DC
- PLC outputs 24 V DC
- Analog inputs ±10 V
- inputs for thermistors

PLC window

- Small PLC window
- Large PLC window
- PLC soft keys
- PLC basic Program

Commissioning and diagnostic aids

- TNC diag : Software for diagnostics of digital drive systems
- TNC opt : Software for putting digital control loops into service
- Integrated oscilloscope
- Trace function
- Logic diagram
- Table function
- Log

Data interfaces

- Ethernet (100 BaseT)
- RS-232-C / V.24
- RS-422 / V.11

Protocols

- Standard data transfer
- Blockwise data transfer
- Blockwise data transfer during simultaneous Program run with program memory on the hard disk
- LSV2
- USB 2

USER FUNCTIONS

Program entry

- HEIDENHAIN plain language
- smarT.NC
- ISO

Cycle programming

- Standard Milling, drilling and boring cycles
- SL cycles
- Touch probe cycles
- OEM cycles

Variant programming

- Q parameters (variables)
- Mathematical functions

Programming aids

- Programming graphics
- Program verification graphics
- Graphical support for Cycle programming
- Pocket calculator
- Context-sensitive help for error messages
- Calculation of cutting data
- Machining-time display

Preset tables

Datum tables

Pallet management

Tool management : Tool-life monitoring, replacement tools

Conversational languages English, German, Czech, French, Italian, Spanish, Portuguese, Swedish, Danish, Finnish, Dutch, Polish, Hungarian, Russian (Cyrillic), Chinese (traditional, simplified), further languages as option (e.g. Slovene)

SOFTWARE OPTIONS

Collision monitoring : Real-time workspace monitoring with Dynamic Collision Monitoring (DCM)

DXF conversion : Importing and converting of DXF fi les

Feature Content Level (FCL) : New functions with software updates

HEIDENHAIN-DNC : For access to control information and functions from PC applications

Conversational language : Additional conversational languages

Electronic handwheels

- One HR 410 / HR 420 or
- One HR 130 or
- Up to three HR 150 over HRA 110

Touch probes : TS 220 or TS 640; TT 140

PLC basic program

iTNC programming station :
Control software for PCs for programming,archiving and training

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